

# Difference Between Adaptive Radiation and Divergent Evolution

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## Key Difference – Adaptive Radiation vs Divergent Evolution

Adaptive radiation and divergent evolution are two processes related to [speciation and evolution](#). Both these processes involve diversification of a [species](#) from a common ancestor. **Adaptive radiation is the diversification of a species into different forms in order to adapt to different environmental conditions for their survival. Divergent evolution is the accumulation of differences between groups of organisms that lead to the creation of new, different varieties of species.** This is the key difference between adaptive radiation and divergent evolution.

### What is Adaptive Radiation?

Radiation refers to the process of speciation of one species into a number of different species. There are two forms of radiation named adaptive radiation and non-adaptive radiation. Adaptive radiation is a process of rapid diversification of a species that belong to a common ancestral line into new forms of organisms. This phenomenon occurs due to several factors such as different environmental changes, change in available resources and the availability of new environmental [niches](#). This process initiates from a common ancestor and develops towards different species of organisms that demonstrate morphologically and physiologically varied phenotypic traits.

The best example for adaptive radiation is Darwin's finches. In Galapagos Islands, Darwin observed a rapid diversity of finches which provided a good example for adaptive radiation. He observed all varieties of finches present on the same island and found out that all different varieties are descendants of a common ancestor, which is a seed eating finch.

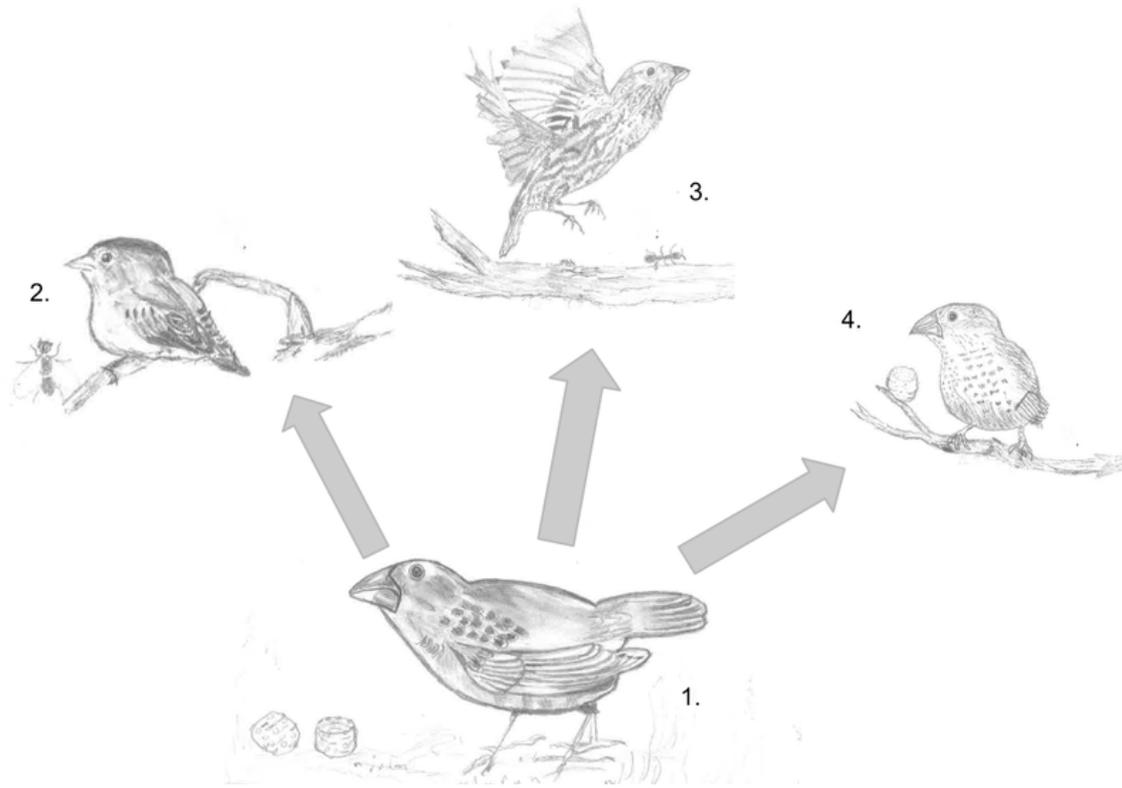


Figure 01: Darwin's Finches (1. *Geospiza magnirostris*, 2. *Geospiza parvula*, 3. *Certhidea olivacea*, 4. *Geospiza fortis*)

Darwin explained how these seed eating finches radiated into different geographical locations and encountered with adaptive changes. The changes were especially observed in the type of beaks. Due to this change in shape of the beaks, some finches gradually became insectivorous and herbivorous in order to suit the new environmental niches.

## What is a Divergent Evolution?

The accumulation of differences between groups of organisms that lead to the creation of new, different varieties of species is known as divergent evolution. This occurs as a result of diffusion of the same species into new, different ecological niches which block the normal flow of genes among distinct populations. This allows the formation of different characteristics due to genetic drift and natural selection. Most common example of divergent evolution is the vertebrate penta-dactyl limb. Limb structure present in different species of organisms has a common ancestor and has encountered a divergence in its overall structure and function accordingly.

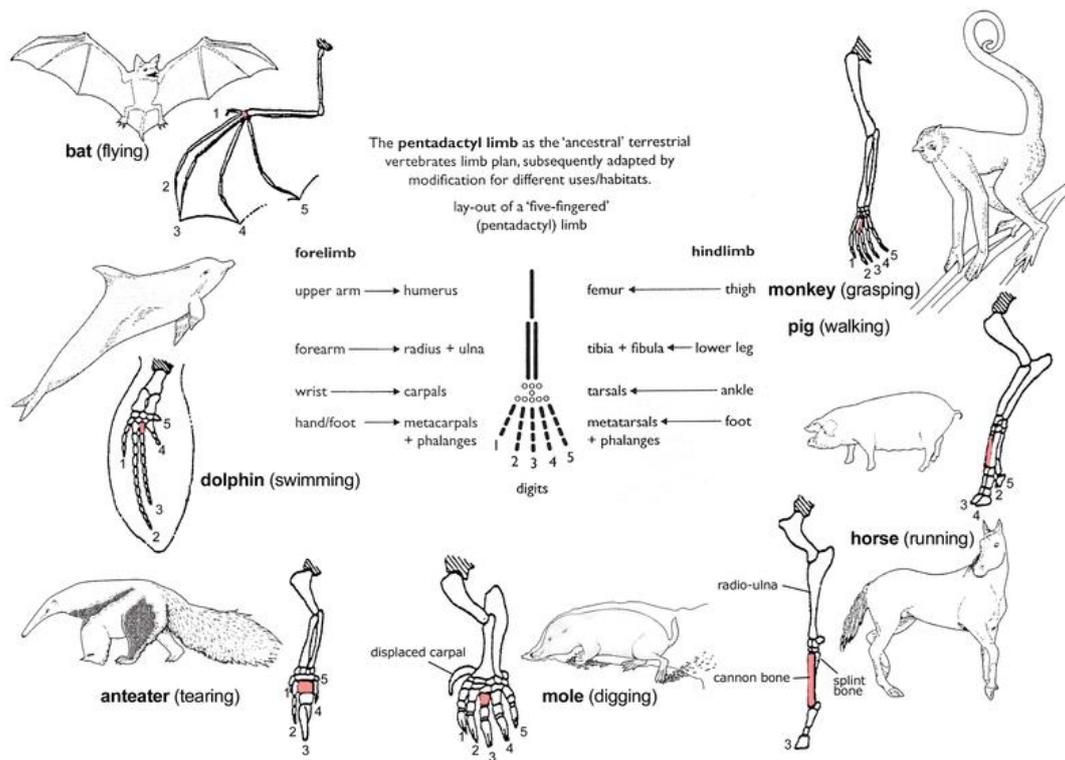


Figure 02: Evolutionary development of the vertebrate limb

## What are the similarities between Adaptive Radiation and Divergent Evolution?

- In both processes, the different species originate from a common ancestral line and therefore species are closely related.
- Both processes bring a particular change to a population over time and appearance of species becomes different over time.
- Both are involved in the formation of a new species of organisms developed from a pre-existing species, which depend on selective environmental pressure.

## What are the differences between Adaptive Radiation and Divergent Evolution?

### SSRI vs SNRI

Adaptive radiation is the diversification of organisms that belong to a common ancestral line into new forms of organisms based on different ecological niches.

Divergent radiation is the accumulation of differences between groups of organisms that lead to the creation of new, different varieties of species.

Type of Evolution	
Adaptive radiation is a type of micro evolution.	Divergent evolution is a type of macro evolution.
Process	
Adaptive radiation is a rapid process.	Divergent evolution is a relatively slow process.
Outcome	
The outcome of the adaptive radiation is different morphological, physiological and ecological changes in a particular population.	A new generation of species is formed which are unable to interbreed with the original species.
Examples	
Examples of adaptive radiation include Darwin's finches and Australian marsupials.	Penta-dactyl limb structure of mammals is an example of divergent evolution.

## Summary – Adaptive Radiation vs Divergent Evolution

Adaptive radiation and divergent evolution are two processes of evolution which describe the emergence of a new species due to natural selection and genetic drift. Adaptive radiation is a process which causes changes in the morphological, physiological and ecological diversity of a population and is a type of microevolution. Divergent evolution is a process which causes the formation of new species from a pre-existing species. This is the difference between adaptive radiation and divergent evolution.

### References:

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## Image Courtesy:

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2. “Evolution pl” By Mcy jerry at the English language Wikipedia ([CC BY-SA 3.0](#)) via [Commons Wikimedia](#)

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